



WOOD COUNTY
HOSPITAL

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Vascular Access Device Care and Maintenance for Clinical Nursing Instructors

Vascular Access Device Education Module

To assure a standardized knowledge base related to CVL Care and CLABSI prevention, WCH requires all Instructors/Faculty on all units to complete this educational module. This content is also required for every nurse hired to WCH.

All Instructors/Faculty will complete this content in 2026 and going forward the module will be required as part of orientation. Completion Validation is required on the last slide.

POLICY reminders related to Nursing Student Privilege and Limitations with **Central Lines**

See Policy for full details

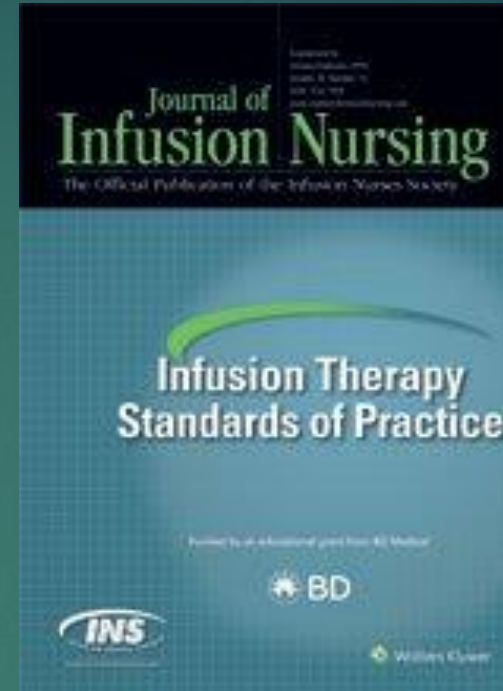
- Central line dressing care, DE clotting and discontinuation may **ONLY** occur under the direct supervision of a **Staff RN**
- All other aspects of IV care and use (Peripheral and Central) may occur with the direction supervision of the Clinical Instructor or Staff RN
 - *For all pediatric patients, the Staff RN has direct oversight of all Central Line care in addition to the instructor

Wood County Hospital & Infusion Nurse Society

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Wood County Hospital has been following Infusion Nurse Society practice guidelines for years and our policies align with them.



Infusion Nurse Society (INS) is a professional association dedicated to enhancing infusion practices that will improve patient outcomes. The INS Standards provide evidence-based guidance and practice recommendations to improve patient safety in infusions and vascular access care.

Definitions

- PULSATILE FLUSH
- ANTT
- CLINICAL INDICATIONS

Pulsatile Flush

- Used in both PVAD & CVAD
- Using a pre-filled 10mL preservative free 0.9% normal saline administer 10 short boluses of 1 mL solution interrupted by brief pauses.
- **This technique is recommended over 'typical flushes' as it is found to be more effective at removing fibrin, drug precipitate, and intraluminal bacteria.**

Aseptic Non Touch Technique (ANTT)

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Standard-ANTT

A type of aseptic technique with a unique theory-practice framework based on an original concept of Key-Part and Key-Site Protection; achieved by integrating Standard Precautions such as hand hygiene and personal protective equipment with appropriate aseptic field management, non-touch technique, and sterilized supplies.

A combination of Standard Precautions and an approach of protecting **Key-Parts** and **Key-sites** individually, using non-touch technique and Micro critical aseptic fields within a general aseptic field.

Used during short procedures such as:

- VAD flushing & locking
- Administration set prep and change
- IV medication administration
- If Key-Sites or Key-Parts require direct touch, sterile gloves must be used

Surgical-ANTT

A combination of Standard Precautions and an approach of protecting **Key-Sites** and **Key-Parts** collectively using a sterile drape and barrier precautions.

Used for clinically invasive procedures where achieving asepsis and protecting Key-Parts and Key-Sites are difficult and /or procedures are long in duration such as CVAD insertion.

Terms related to ANTT

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Key-Site: any portal of entry into the patient

- VAD site
- Injection site
- Open wound

Key-Part: the part of the procedure equipment that if contaminated is likely to contaminate the patient

- Syringe tip
- Luer end/spike of admin set
- Injection needle

General Aseptic Field: a decontaminated and disinfected procedure tray or single-use procedure kit/barrier. Used to promote asepsis, however doesn't ensure it.

Critical Aseptic Field: a sterile drape barrier used to ensure asepsis procedure equipment is placed upon the drape and managed collectively

Micro Critical Aseptic Field: a small protective sterile surface/housing

- Sterile caps
- Covers
- Inside of equipment packaging

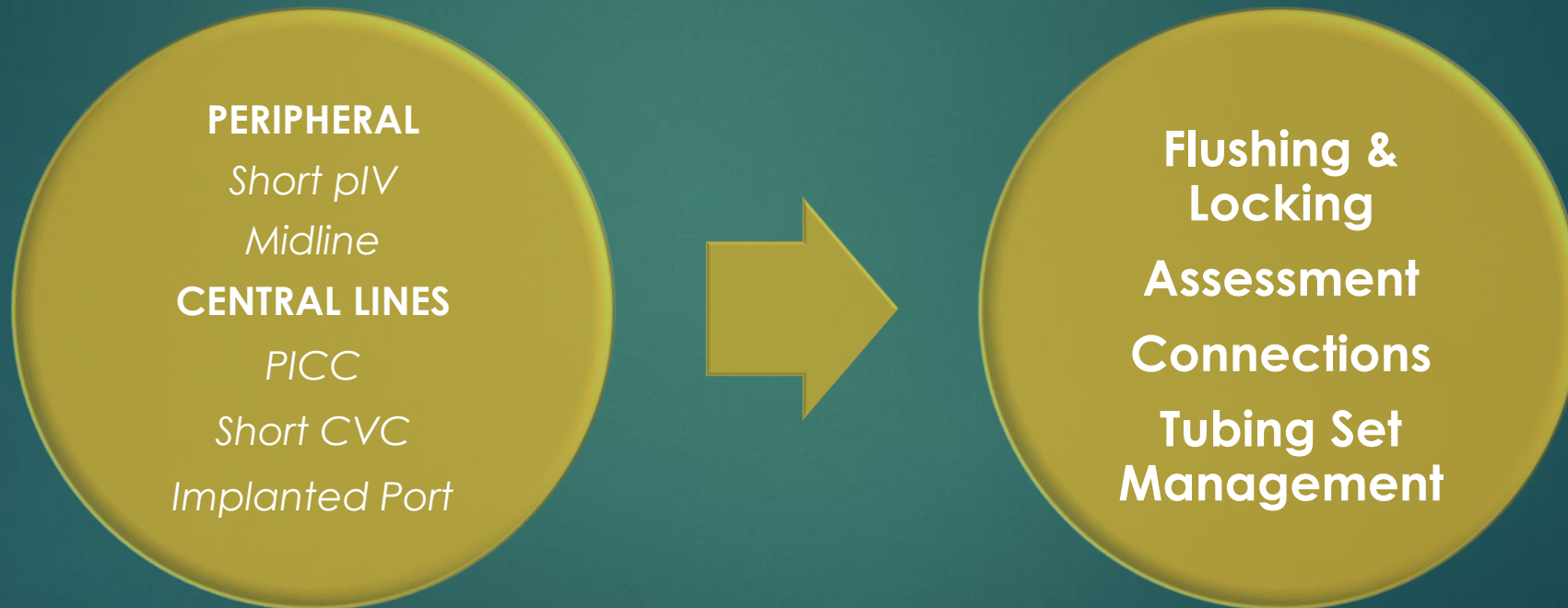
Clinical Indications

Signs and symptoms of catheter associated blood stream infections such as:

- Purulent drainage
- Edema
- Erythema
- Leaking
- Pain/discomfort with or without flush/infusion
- Change in skin color and or temperature
- Extravasation of vesicant medication

The first section will focus on practices that are standard between
ALL IV access; peripheral and central

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PVAD & CVAD Flushing & Locking

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1. Remove alcohol impregnated cap - **Scrub hub** at least 5 sec - Allow to dry completely
2. Connect syringe with ANTT
3. **Before each use - Aspirate for blood return** with 10-mL barrel prefilled 0.9% sodium chloride syringe to assess catheter patency
failure to obtain a blood return may occur and may not require catheter replacement – assess ease of flushing, no discomfort or other signs of complications.
4. **Flush** catheter with **new syringe** after med administration to prevent mixing of incompatible medications or solutions
do not use same syringe used to assess and flush site to reduce risk of contamination

Flushing:

- **Scrub Hub**
- **Aspirate blood return**
- **Flush line**
- **Administer med**
- **Flush catheter**

PVAD & CVAD Flushing & Locking

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5. **Consider using Pulsatile Flush**
6. Use 5% dextrose in water if med is incompatible with normal saline, followed by normal saline flush.
7. **DO NOT leave D₅W in catheter lumen as this increases the risk of biofilm growth!**
8. **Always flush/lock after each use**
Infusions, single medication administrations, saline locking for brief shower or x-ray, blood sampling!

Flushing:

- **Scrub Hub**
- **Aspirate blood return**
- **Flush line**
- **Administer med**
- **Flush catheter**

Prefilled Flush Syringes

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DO NOT use prefilled 0.9% preservative free flush syringes for dilution of medications:

- Gradation markings are different
- There is an unchangeable label on prefilled syringes
- Increased risk to lose partial drug dose
- Increased risk for contamination
- Increased risk of serious medication error with syringe-to-syringe drug transfer



PVAD & CVAD Assessment

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- Assess necessity daily – if not used for > 24 hours advocate for discontinuation
- Site, solution, and rate will be assessed **minimally**:
 - With each infusion
 - Every 4 hours
 - Every 1-2 hours for critically ill, sedated, those with cognitive deficits, or those with vesicant infusions

PVAD & CVAD Assessment

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- Site assessment will include inspecting and palpating surrounding area for skin integrity, dressing and securement device
 - Assess for signs of dislodgement, redness, tenderness, swelling, induration, temperature, drainage
 - Assess if pain, paresthesia, numbness, or tingling

PVAD - Midline Specific Assessment & Care

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When assessing a midline insertion site and upper-arm, if you note swelling, erythema, edema, blanching, or change in pain or temperature of extremity:

- Measure 10 CM above Antecubital (should be marked) – if not, mark it for future comparison
 - Compare to measurement documented on insertion

PVAD & CVAD Care – Connection

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- All accessed lines will have a **MaxZero** needleless connector
- MaxZero is a **Positive Displacement device** requiring the following clamping sequence:
 - Flush
 - Disconnect
 - Clamp
- Change the MaxZero Needleless connector in the following circumstances:
 - When removed for any reason
 - Prior to drawing a sample for a blood culture from CVAD
 - When contaminated
 - Dysfunction
 - Residual blood or debris within
 - When continuous infusion primary administration set is changed
 - Per manufacturer directions

PVAD & CVAD Care – Connection

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- All access ports will have an alcohol impregnated cap (Curos)
- When removed for access – scrub hub with alcohol wipe x 5 sec and allow to dry
- After each use, apply **new** Curos cap

PVAD & CVAD Care – Tubing Sets

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If multiple lines are in use (peripheral, central, epidural, or hemodynamic monitoring)

- Trace all catheters/sets/add-on devices between the patient and the solution before connecting
- **LABEL EACH TUBING** with the route and medication/solution near the connection to the solution and near the patient's access site.
- Unless otherwise stated by manufacturers' directions **PRIMARY AND SECONDARY CONTINUOUS** infusion administration sets will be changed at least every 7 days unless:
 - Set becomes contaminated
 - New IV started
 - Dysfunction

Hint:
Plan to change the primary administration set to coincide with the VAD change.

PVAD & CVAD Care – Tubing Sets

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- Avoid disconnecting primary and secondary continuous administration sets
- When administering **SECONDARY INTERMITTENT MEDICATIONS**:
 - If medication(s) and solution(s) are compatible, use **ONE** secondary administration set and back prime from the primary infusion container to each secondary medication administration
 - If any medication or solution is incompatible, disconnection is unavoidable. Each secondary will require an individual secondary tubing
 - Aseptically attach a new, sterile luer cap between uses
 - Tubing set is now considered intermittent and must be changed every 24 hours
 - Label tubing with medication and expiration date
- Manage height of infusion to assure accurate dose delivery
 - Primary hung on fully extended hanger; secondary infusion at ~24" above top of the pump

PVAD & CVAD Care – Tubing Sets

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- **PRIMARY INTERMITTENT ADMINISTRATION** sets must be changed every 24 hours
 - When disconnected, attach a new sterile luer lock cap
- **Administer IV push medications** through an injection port closest to the patient at the rate recommended by drug manufacturer
 - Complete administration with flush at the same rate to ensure that the entire dose has reached the bloodstream

PVAD & CVAD Care – Tubing Sets

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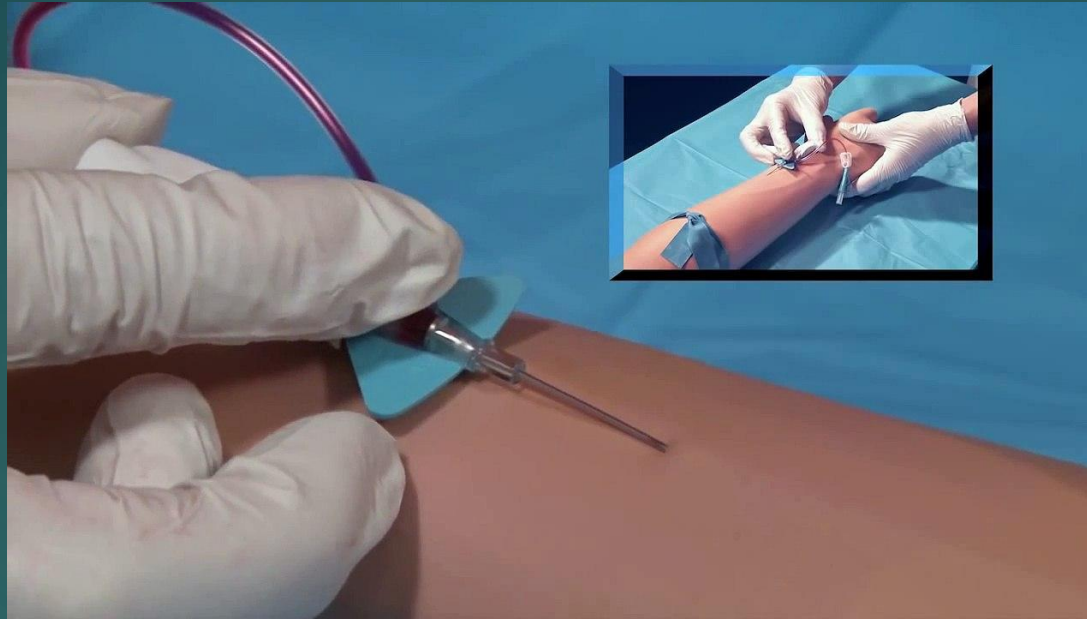
High Risk Medication Infusions

- High-risk medications are given through a **PRIMARY INFUSION SET** using a separate electronic infusion pump to control the rate of the high-risk medication
- DO NOT infuse high-risk medications as **secondary infusions** to prevent inaccurate dose delivery
- Connect IV solutions as close as possible to the hub of the VAD
- Do not sequentially connect more than 1 primary continuous administration set to the Y-sites of the sets connected to the same lumen
- Always confirm compatibility
- Promptly disconnect the administration set when discontinuing a medication!

Vascular Access Device – Points of Emphasis

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- Always use ANTT ® when working with IV access
- Needleless Connectors (MaxZero) are **Positive Displacement** – for best results clamping sequence is:
 1. Flush
 2. Disconnect
 3. Clamp
- To prevent damage – ALWAYS use 10mL syringe to assess patency
- Always flush intermittently used IVs using pre-filled 10mL preservative free saline solution
- All access points will be covered with new alcohol impregnated cap (Curos) after each use



Peripheral Vascular Access Device

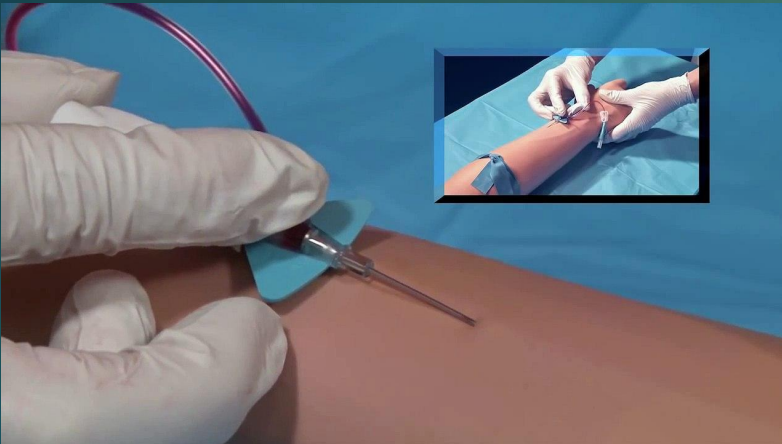
PVAD SPECIFIC

POLICIES AND BEST PRACTICES

Peripheral VAD

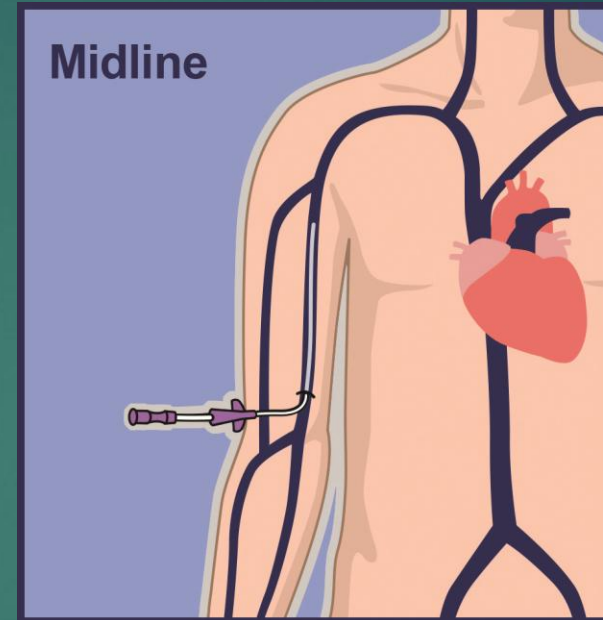
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Short Peripheral IV Catheters (Short PIVC)



- Inserted by RNs, LPNs, and Paramedics with documented competency
- May stay in 7 days or less

Midline Catheter

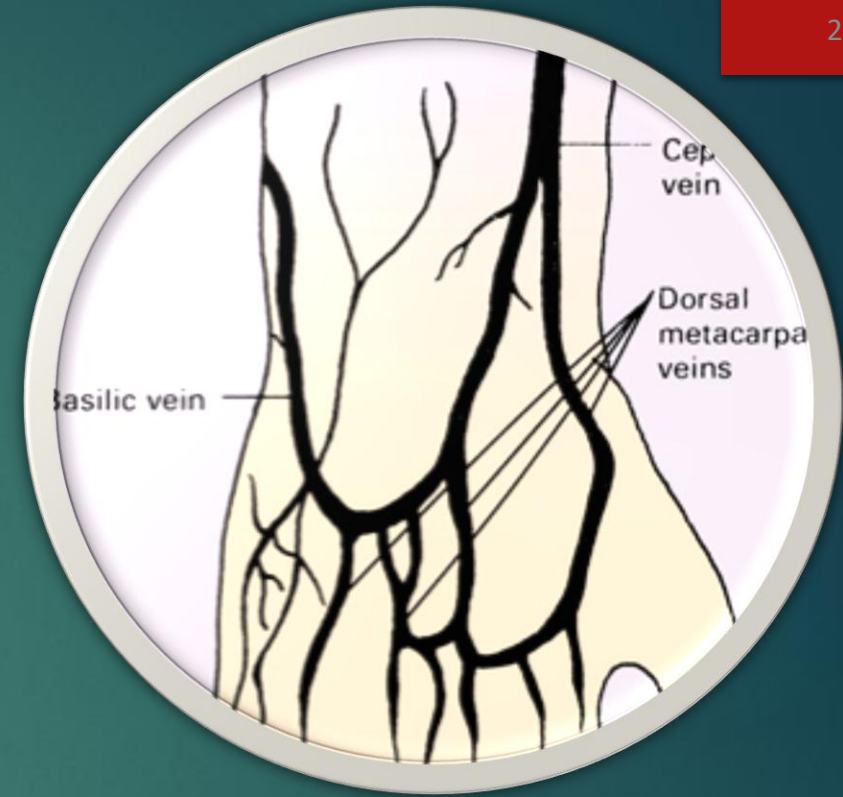


- Inserted by RNs with documented competency from WCH approved company
- May stay in for 14 days (or longer in some situations)

Peripheral VAD

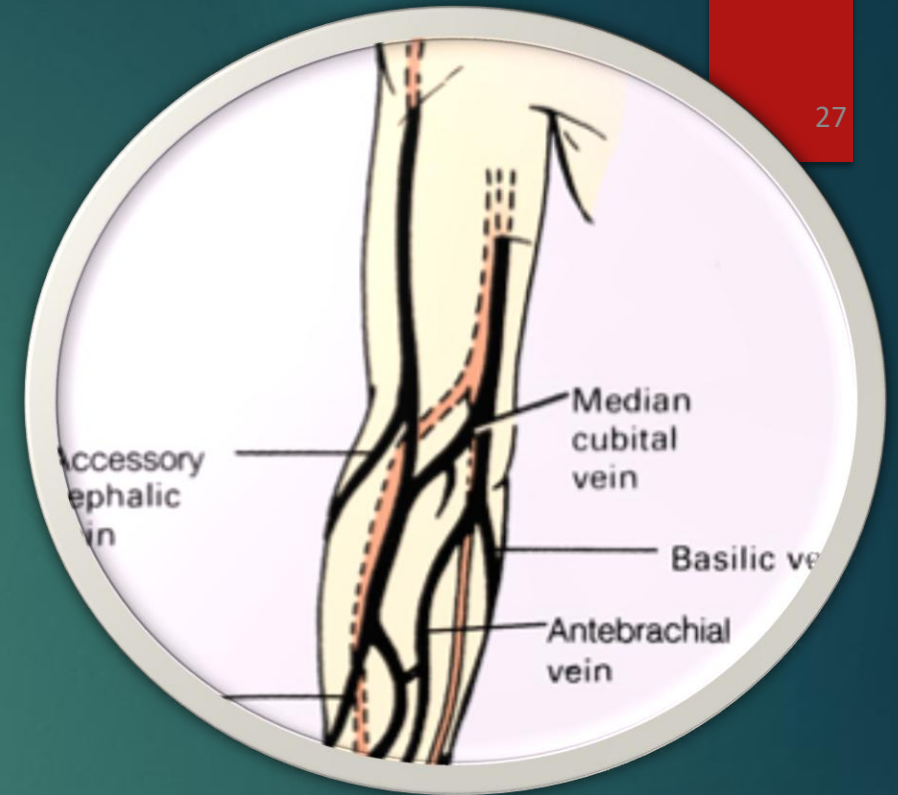
Short PIVC

- Inserted in superficial vessels of hand and lower arm
- Although Antecubital vessels are recommended for quick access and some radiologic procedures – **they are NOT recommended for routine PVAD due to higher catheter complication rates**
- If AC used, consider replacing and/or using board to reduce bending



Peripheral VAD Midline Catheter

Inserted in basilic, cephalic, or
brachial vein of upper arm
**with tip extending to or
near level of the patient's axillary line**



THIS IS NOT A CENTRAL VENOUS ACCESS DEVICE OR PICC!

There is no such thing as a Mid PICC

PVAD Blood Sampling

TIPS TO REDUCE RISK OF HEMOLYSIS
WITH PIVC INSERTION
INDWELLING PIVC
CORRECT COLLECTION TUBE SEQUENCE
LABELING

Blood Sampling – Reducing Risk of Hemolysis

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With Nexiva Catheter

- Leave filter on end
- Do not clamp

Make sure syringe or tube holder is securely inserted into IV hub

Do not leave tourniquet on more than 1 min

Remove tourniquet once blood return achieved

Fill tubes in correct order

- Most tube types contain additives in varying concentrations.
- Obtaining samples in the correct order is important *because contamination from the additive in a previous collection tube can cause erroneous test results.*

Fill tubes to correct amount

- You must mix the additive in the tube with the blood sample by holding the tube upright and gently inverting it 180 degrees and back immediately after drawing.
- The number of inversions varies by tube type in following slides

Blood Sampling- Reducing Patient Risk

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Reduce risk of healthcare acquired anemia by:

- Limiting blood tests to only those needed for diagnosis and treatment
- Draw minimal volume needed
- Use small volume collection tubes (if applicable for specific testing)
- Use point-of-care testing when appropriate
- Consider using closed loop system for venous and arterial sampling that returns blood to the patient
- Use push-pull mixing method (if Hgb < 8 and frequent lab draws necessary), see p. 62
- If possible, coordinate timing of draws to as few a day as possible
- Reduce 'wasted' specimens (contaminated cultures; hemolyzed or clotted)
- Use correct draw sequence, proper fill volume, and gentle inversion

Blood Sampling Short PIVC with Insertion

(vacutainer method)

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- Verify order
- Verify patient allergies
- Gather equipment
- Hand hygiene
- Confirm patient ID
- Provide privacy
- Explain procedure – confirm NPO status if necessary
- Assist patient to recumbent position
- Hand hygiene
- Apply PPE
- Position arm in dependent position
- Apply tourniquet about 2" above planned insertion site
- Prepare site using applicator in IV start kit
- Immobilize the vein **do not touch insertion site**
- Leave clamp open and filter in place on Nexiva catheter
- Once blood return flows into tubing, **release the tourniquet**, secure IV with Tegaderm **DO NOT LEAVE TOURNIQUET ON LONGER THAN ONE MINUTE**
- Briefly clamp tubing, remove filter and apply luer vacutainer holder, **unclamp prior to placing tube in holder**

Blood Sampling Short PIVC with Insertion (vacutainer method) cont.

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- Collect specimens in correct order
- Remove each tube from the holder, gently invert then return to upright position
- After all samples have been collected,
 - briefly clamp extension tubing
 - remove vacutainer holder and
 - apply primed MaxZero needleless connector.
- Perform pulsatile flush
- Disconnect and clamp or initiate fluid as ordered.

Stopper Color & Draw Order	Common Lab Use & Collection tube type	Gentle Inversions Required to Properly Mix Sample
 Blue stopper	Coagulation Citrate	Must be filled completely with no saline or air 3 -4 times
 Red and black stopper	Serum Chemistry Gel, serum	5 times
 Gold closure	Serum Chemistry Gel, serum	5 times
 Red stopper	Serum Chemistry No gel, serum	Glass – 0 times Plastic 5 times
 Green stopper	Plasma Chemistry Heparin	8-10 times
 Gray and green sto...	Plasma Chemistry Heparin	8-10 times
 Lavender stopper	Whole blood Hematology EDTA	8-10 times
 Pink stopper	Whole blood Blood Bank Type & Screen/Xmatch EDTA	8-10 times
 White closure	Molecular diagnostic testing Potassium EDTA	8-10 times
 Gray stopper	Glucose, Lactic Acid Sodium fluoride	8-10 times

Blood Sampling Short PIVC with Insertion (syringe method)

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- Verify order
- Verify patient allergies
- Gather equipment
- Hand hygiene
- Confirm patient ID
- Provide privacy
- Explain procedure
confirm NPO status if necessary
- Assist patient to recumbent position
- Hand hygiene
- Apply PPE
- Position arm in dependent position
- Apply tourniquet about 2" above planned insertion site
- Prepare site using applicator in IV start kit
- Immobilize the vein – **do not touch insertion site**
- Leave clamp open and filter in place on Nexiva catheter
- **Once blood return flows into tubing, release the tourniquet, secure IV with Tegaderm DO NOT LEAVE TOURNIQUET ON LONGER THAN ONE MINUTE**
- Briefly clamp tubing, remove filter, apply syringe, unclamp and aspirate sample

Blood Sampling Short PIVC with Insertion (syringe method) cont.

- After aspirate enough blood for samples have been collected,
 - briefly clamp extension tubing,
 - remove syringe and
 - apply primed MaxZero needleless connector.
- Perform pulsatile flush
- Disconnect and clamp or initiate fluid as ordered.
- Connect syringe to luer transfer device and fill vacutainers in correct sequence
- Remove each tube from the holder, gently invert then return to upright position
- Carefully invert each collection tube according to additive
- Label according to directions on p. 37

Stopper Color & Draw Order	Common Lab Use & Collection tube type	Gentle Inversions Required to Properly Mix Sample
 Blue stopper	Coagulation Citrate	Must be filled completely with no saline or air 3 -4 times
 Red and black stopper	Serum Chemistry Gel, serum	5 times
 Gold closure	Serum Chemistry Gel, serum	5 times
 Red stopper	Serum Chemistry No gel, serum	Glass – 0 times Plastic 5 times
 Green stopper	Plasma Chemistry Heparin	8-10 times
 Gray and green sto...	Plasma Chemistry Heparin	8-10 times
 Lavender stopper	Whole blood Hematology EDTA	8-10 times
 Pink stopper	Whole blood Blood Bank Type & Screen/Xmatch EDTA	8-10 times
 White closure	Molecular diagnostic testing Potassium EDTA	8-10 times
 Gray stopper	Glucose, Lactic Acid Sodium fluoride	8-10 times

Blood Sampling from Indwelling PIVC

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Blood sampling can be obtained from an indwelling PIVC; however this should NOT be routine, benefits and risks must be review and decision documented

Risks include:

- Hemolysis
 - Results in delayed results and redraw
- Contamination of specimen from solutions and medications
- Phlebitis or infiltration from excessive catheter manipulation
- Dislodgement

Benefits include:

- If unable to obtain sample from direct venipuncture or frequent labs required
 - Consider advocating for different placement
- Patient satisfaction
 - Reduced pain
 - Reduced anxiety when difficult stick

Blood Sampling from Indwelling PIVC

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If the best choice for the patient is to obtain blood samples from an indwelling PIVC Syringe Method follow these steps:

Verify order

Verify patient allergies

Gather equipment

Hand hygiene

Confirm patient ID

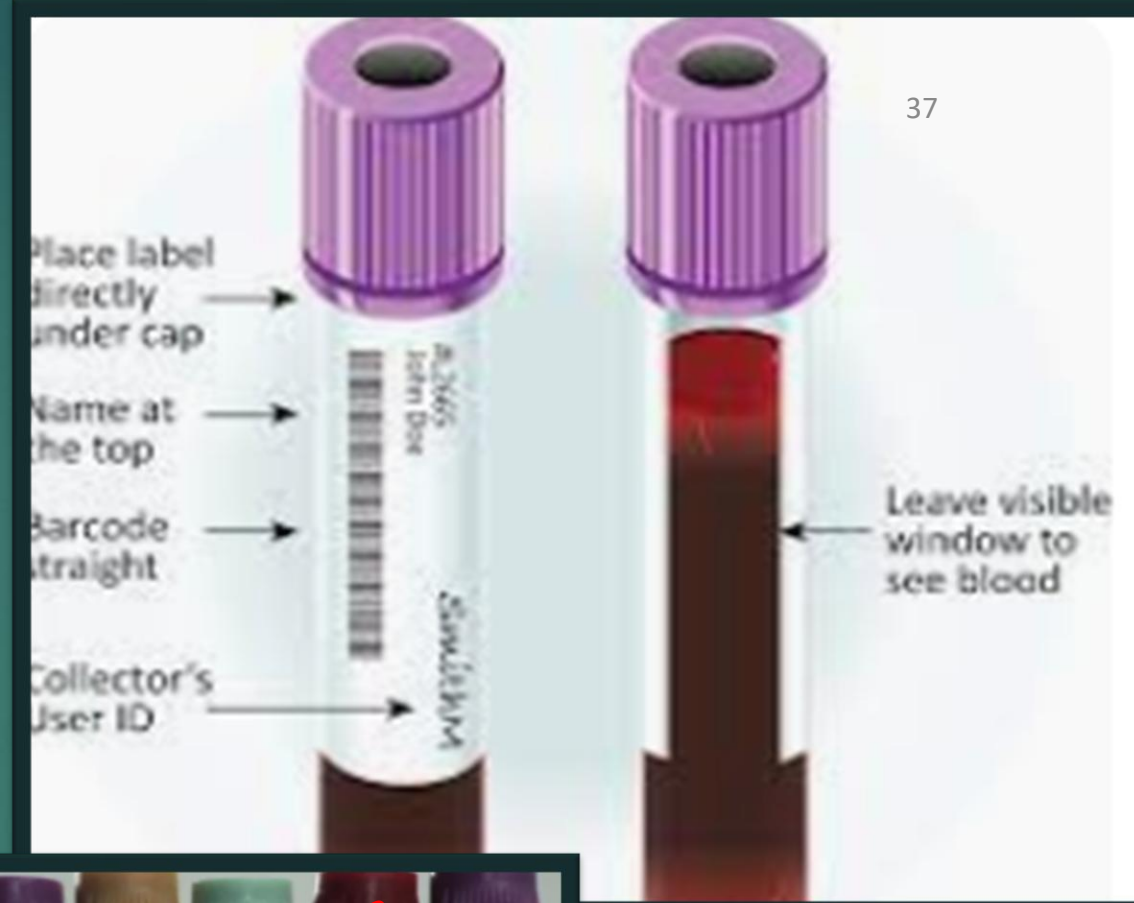
Stop infusions (~1-2 min prior to start)

- Explain procedure
- Assist patient to recumbent position and position arm in dependent position
- Hand hygiene
- Apply PPE
- Scrub hub with alcohol prep x 5 sec allow to dry
- **Apply syringe and aspirate 1 -2mL waste and discard**

- Scrub hub x 5 seconds allow to dry
- **Maintaining sterility of the syringe tip**, attach empty syringe and aspirate needed volume
 - **Using 3-5mL syringe will allow better blood flow than a 10mL syringe**
 - **repeat until enough blood is obtained.**
- Scrub hub x 5 seconds allow to dry
- Attach a prefilled 10 mL syringe to needleless and flush
 - **Failure to flush IV catheters may lead to thrombotic occlusion**
- Fill required blood collection tubes using needleless transfer device.
- Fill to appropriate level, in the correct order and invert per table on page 29.

Blood Sampling Proper Label

- Label the samples in the presence of the patient after confirming patient identity with 2 patient identifiers matches printed label
- Add your name, date, time collected and with IV start
- Follow procedure to route lab



PVAD Care & Removal

SHORT PIVC & MIDLINE

Discontinuing Short PIVC

Remove **Short PIVC** when:

- When placed under suboptimal aseptic conditions, IVs should be discontinued and restarted within 24-48 hours
- Ordered
- Clinically indicated
 - Signs and symptoms of catheter associated blood stream infections, extravasation of vesicant medication
 - Be sure to notify provider
- Removed by:
 - RNs, LPNs, Paramedics, CNTs, PCTs with documented competency and delegation/direction from RN/licensed provider

PVAD Midline Removal

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- Remove Midline PIVC when:
- Ordered
 - Clinically indicated signs and symptoms of catheter associated blood stream infections, extravasation of vesicant medication
 - Be sure to notify provider
- Removed by:
 - RNs with documented competency at the order of licensed provider.

Midline PIVC Removal

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Removal requires careful technique to prevent complications such as:

- Bleeding
- Air embolism
- Catheter embolism

Documentation after removal:

- Discontinued, record length of catheter removed, site condition, dressing activity, dressing, drainage present, patient response to activity, and direct pressure

Midline PIVC Removal

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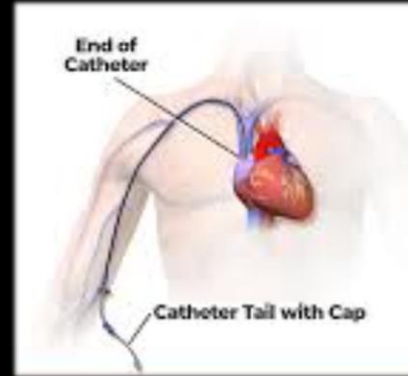
- Review physician order for Line removal.
- Trace tubing and discontinue all infusions and clamp extension set.
- Place a fluid-impermeable pad under patient's arm
- Position patient supine or Trendelenburg, unless contraindicated.
- Stabilize insertion site with one hand, beginning at hub, gently pull the dressing perpendicular to the skin toward the insertion site.
- Repeat to remove stabilization device
- Instruct the patient in Valsalva maneuver, or exhale if Valsalva is contraindicated.
- Hold sterile gauze gently to insertion site with one hand, slowly withdraw catheter using gentle, even pressure.

Midline PIVC Removal

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***Stop if resistance is met:**

- Redress catheter site with sterile dressing
- Apply warm compress above exit site
- Have patient perform relaxation techniques
- Elevate arm
- Reattempt in 15-30 min
- If resistance continues contact provider
- After successful removal apply light pressure to site with sterile gauze for 30 second or until hemostasis is achieved.
- While patient exhales immediately place folded petroleum-based gauze over insertion site.
- Cover petroleum gauze with sterile 4x4 and apply transparent semipermeable
- Date and time dressing for removal in 24 hours.
- Patient should remain supine for 30 minutes post line removal.
- Inspect the catheter:
 - Is it intact or jagged?
 - If Jagged, your patient is at risk for breakage, apply tourniquet proximal to site and consult physician immediately.
 - Line: is the length appropriate as compared to document from insertion record?



CENTRAL VENOUS ACCESS DEVICE

Assessment, Care & Dressing Changes

Short Central Venous Catheter (Short CVC)

Implanted Port image of dual port

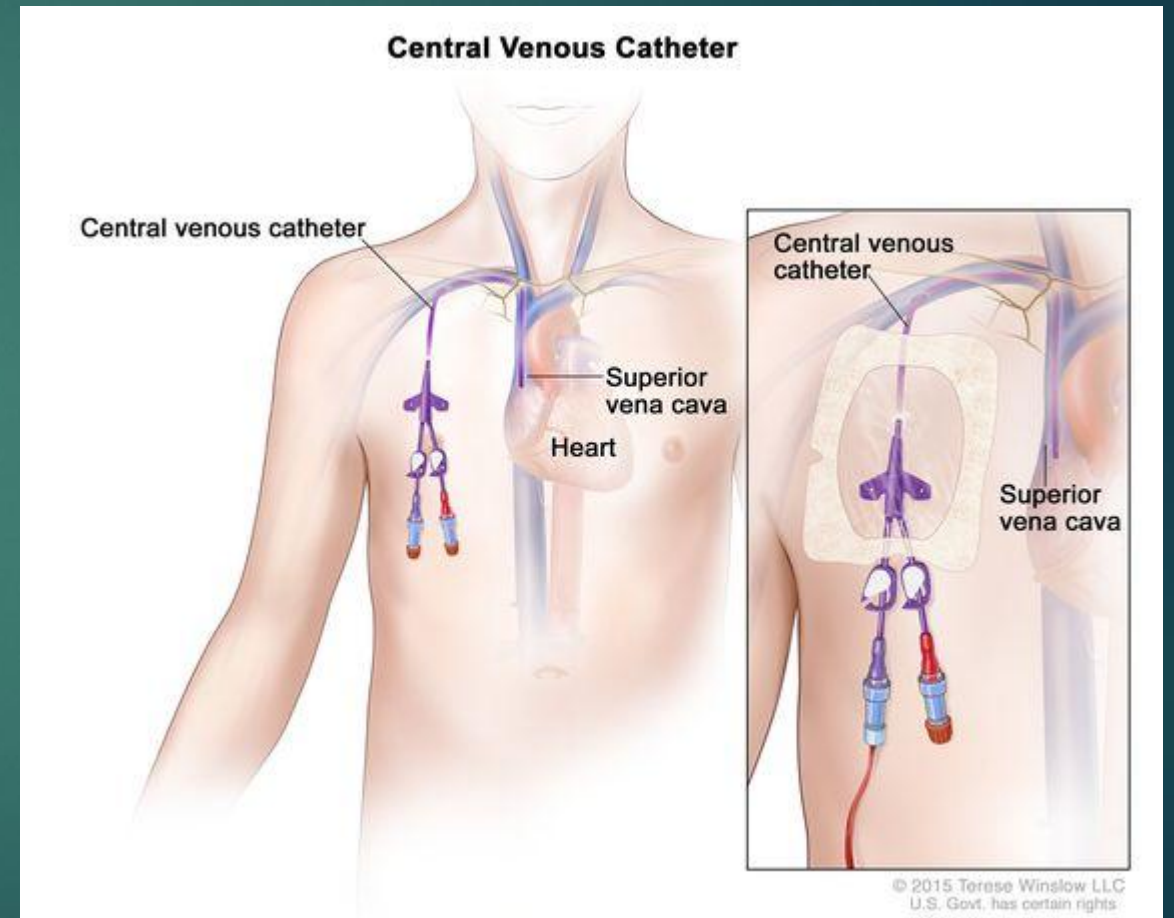
Peripherally Inserted Central Catheter (PICC)



Tip Location of CVADs

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The distal end of CVADs are positioned in the superior vena cava (SVC)



CVAD Dressing Changes

CVAD Dressing Changes:

- Always use CVAD Dressing kit which will include all items needed.
- Transparent semipermeable dressings will be changed every 7 days or PRN as needed
 - Stat lock will be changed with every dressing change
- If gauze is covering the insertion site – dressing must be changed no greater than every 48°
- Dressing kits come with CHG gel patch – see videos on p.47

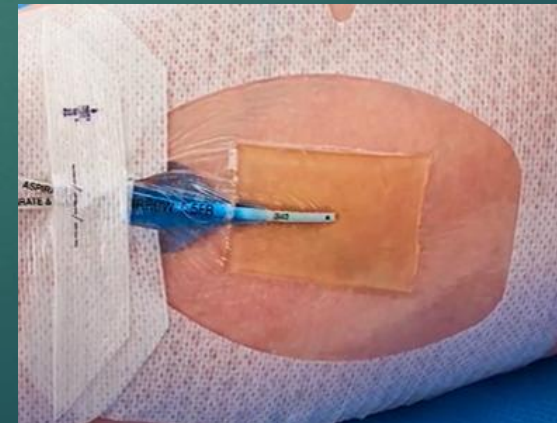
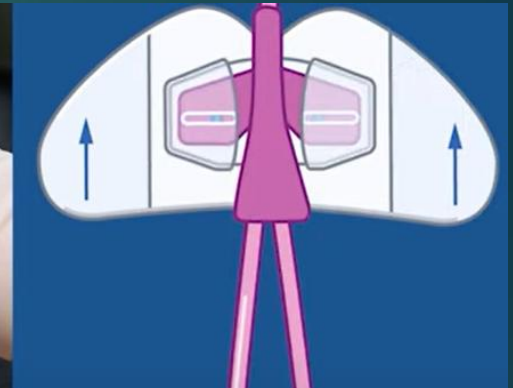
PICC Dressing Change

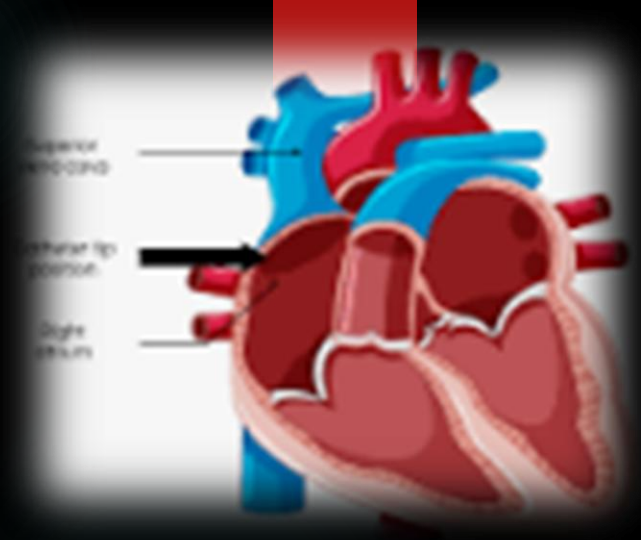
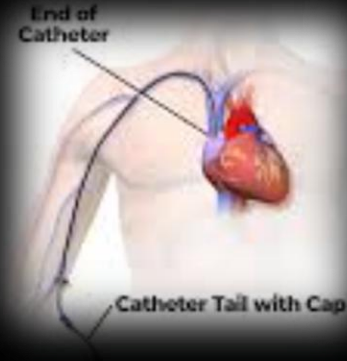
<https://www.youtube.com/watch?v=-bba8aNGWAw>

Short CVC/PICC StatLock Application

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1. Prep skin under securement device with alcohol wipe to remove oils
2. Prepare skin with Skin Protectant Prep Pad allow to dry for 10-15 seconds
3. Place PICC/CVC onto slide posts with arrows toward insertion site
4. **Snap each side closed** *before adhering to skin to reduce pressing on patient*
5. Pull backing off one side and adhere to patient
6. Pull remaining side off and adhere to skin
7. Apply CHG Tegaderm as show in video on p. 49





CENTRAL VENOUS ACCESS DEVICE

PICC Specific Ordering

PICC Screening – Screening Tool for PICC or Midline Initiated Order

Midlines appropriate when patient has:

- Poor vascular access
- Multiple failed PIV
- Restart PIVs >2 in < 24 hours
- Non vesicant therapy < 14 days
- Short term therapy < 6 days
- Intermittent therapy < 4 weeks
- Frequent labs

PICCs are appropriate when patient needs:

- CVP monitoring
- TPN
- Chemotherapy
- Vesicant > 6 days
- Therapy > 6 days
- Intermittent therapy > 14 days
- Non vesicant therapy > 14 days
- High dose Vancomycin

Screening Tool

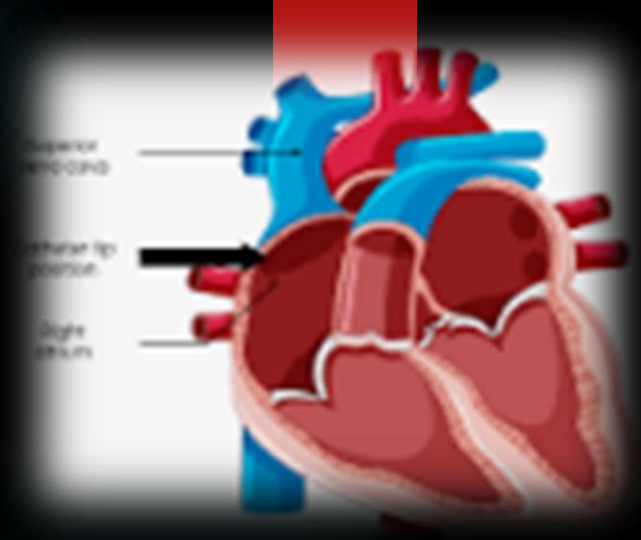
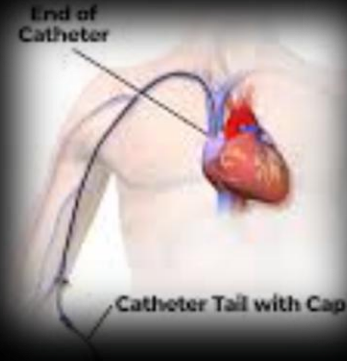
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When initiating the order for Midline or PICC line insertion, the user will be presented with the Vascular Access Screening Tool for completion prior to finalizing the insertion order.

- **The screening tool ensures all criteria have been met prior to notifying Dynamic Access of the need for line placement.**
- Multiple required fields on the form help to determine the appropriate vascular access device needed.

NOTE:

- **If the Vascular Access Screening Tool is not completed and signed the Insertion order will not be placed.**
 - The order will display as a “Skipped” order in the Powerplan.



CENTRAL VENOUS ACCESS DEVICE

PICC & Short CVC Specific Assessment

CVAD Assessment – PICC Specific

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PICC Assessment

- Required: Measure upper-arm circumference to assess for edema and DVT when clinically indicated
 - Measure 10 cm above AC – this should be marked – if not mark for future comparison.
 - **Measure at: time of insertion, with dressing changes and any time swelling suspected**
 - Compare to measurement documented at insertion

Clinical indications include:

- Swelling
- Erythema
- Blanching
- Changes in pain or temp at site

CVAD Assessment – PICC & Short CVC

Specific

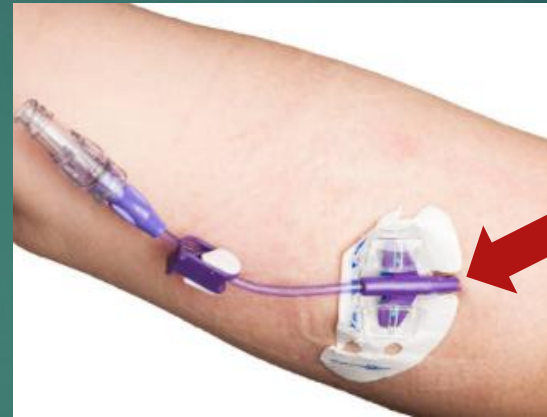
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- To monitor internal or external migration, the external length of catheter will be measured with each assessment, dressing change or at any time malposition is suspected.
- Measured external length will be compared to measured external length at insertion.
- See next slides for measurement tips
- ▶ **External catheter length** for those with PICC, CVC (Internal Jugular and chest subclavian placement):
 - Measure from skin insertion site to hub of catheter
 - Measure with dressing changes with suspected malposition
 - Notify provider when >2cm internal or external migration is noted

Notify provider if >2cm
internal or external
migration noted

PICC External Length

55



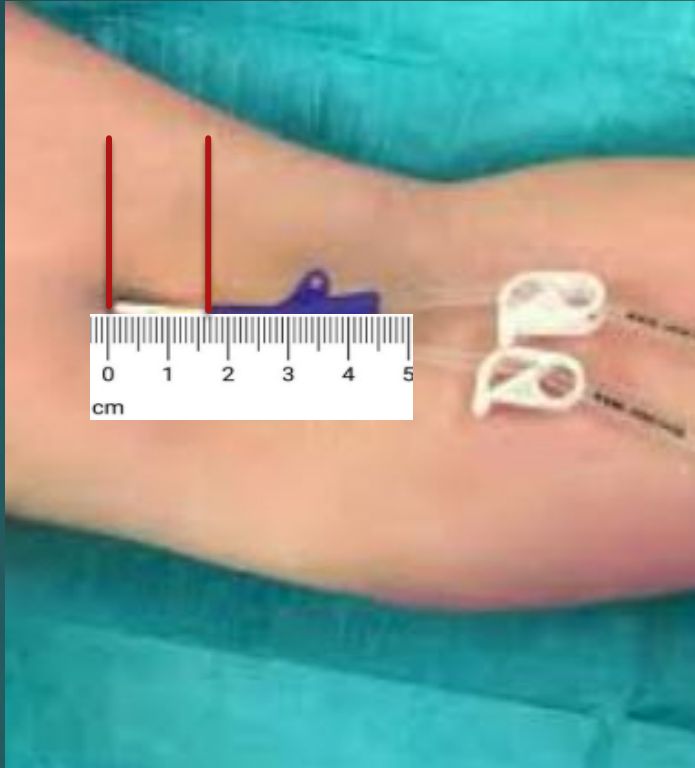
In this image the measurement is "0" since hub is at skin

**Measure from hub to skin for all
Central VAD**

Even if you can see CM markings

PICC External Length

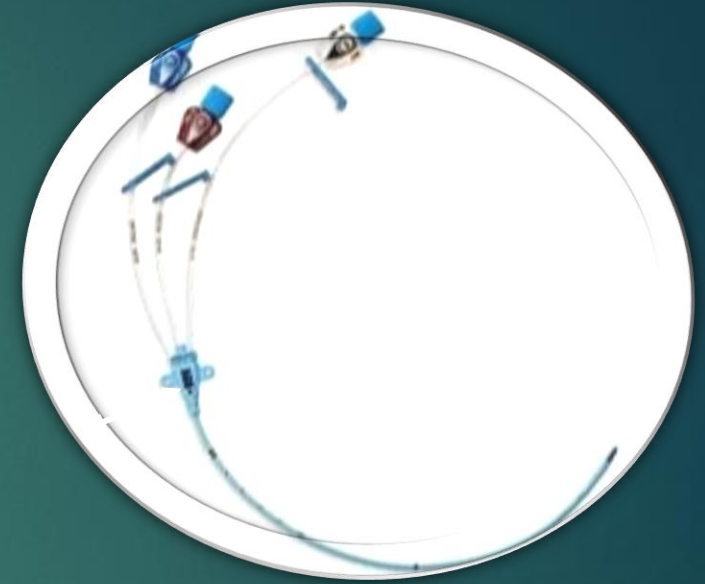
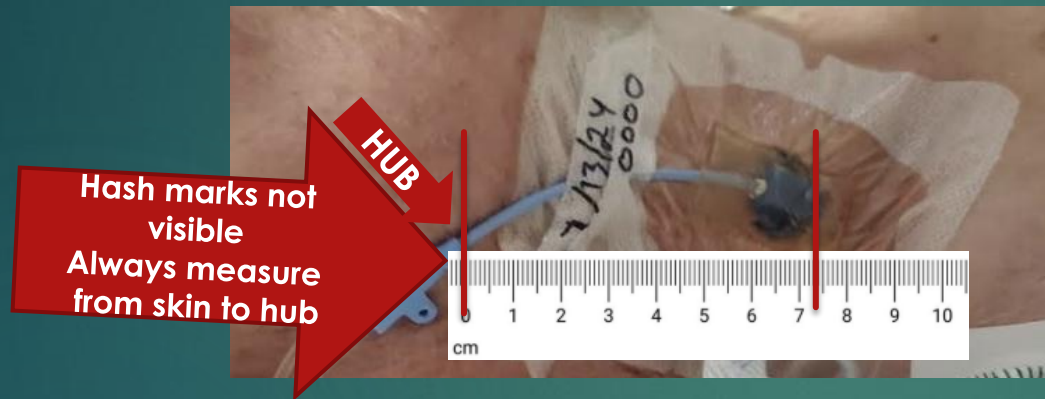
56



**Measure from hub marking to skin
insertion site = 1.6cm**

Short CVC External Length Placed in Internal Jugular

57



Sometimes an additional securement device is added at the insertion site or along length of catheter, the centimeter markings are not visible

So where do you measure?

- Measure with CM tape the distance between hub and skin
- 7.4 CM

Short CVC External Length

58

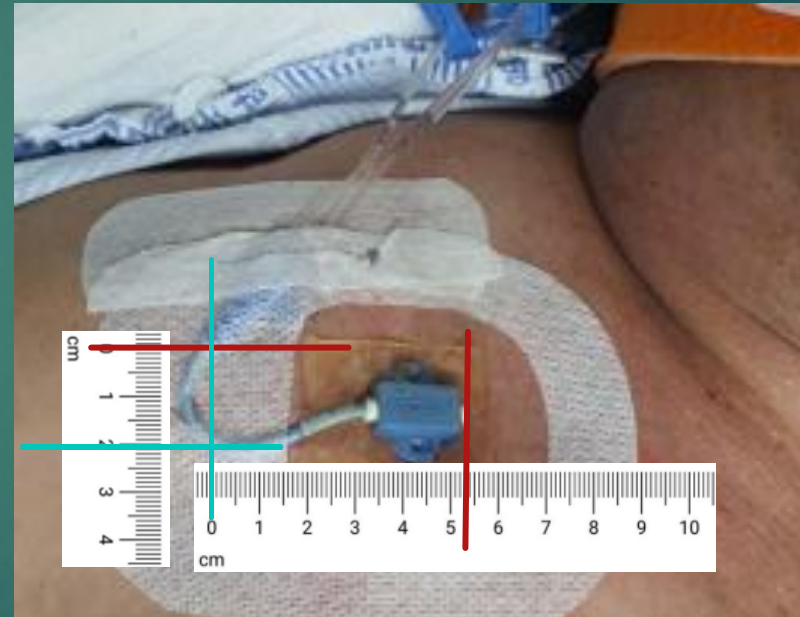
This CVC has an additional securement device at skin level.

To reduce discrepancies always

Measure external length from
skin to blue hub

Although very difficult to measure

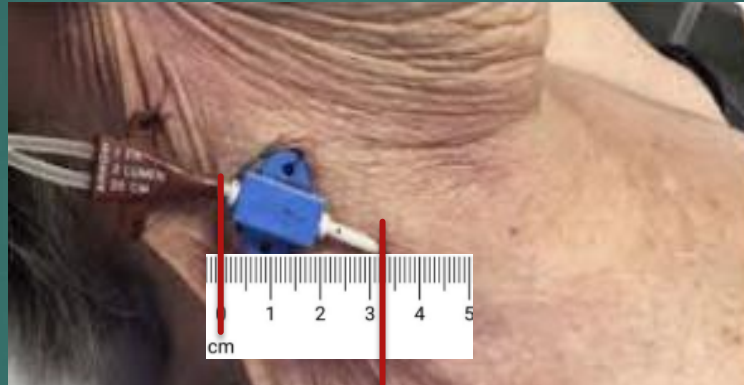
External length is measured 7.4 CM
from hub to skin



Short CVC External Length

59

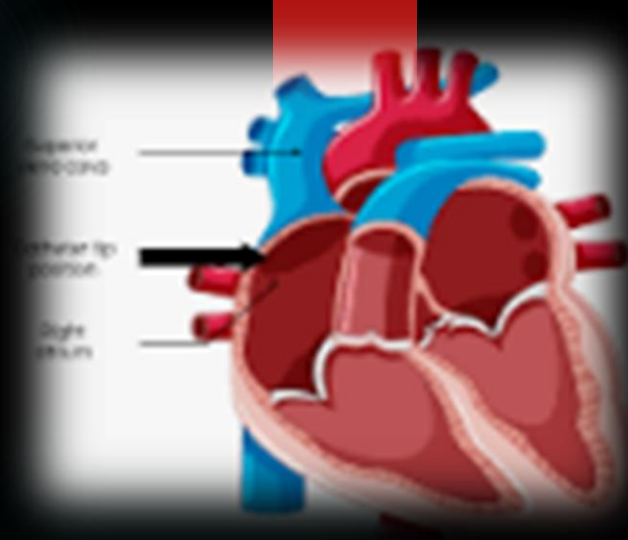
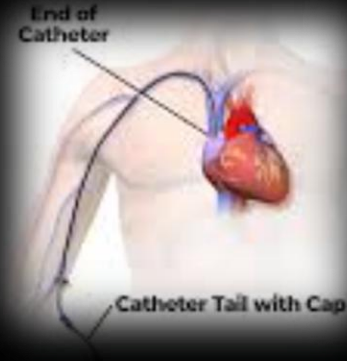
Placed in Internal Jugular



Sometimes providers will add a different securement device at the insertion site making the centimeter markings difficult to visualize.

So where do you measure; what do you do to measure and document?

- In this example measure with CM tape the distance between skin to the brown hub .
- Document **3.3 cm** in I-view



CENTRAL VENOUS ACCESS DEVICE

Implanted Port Specific

CVAD Implanted Port Specific Care

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- **Accessing:**

- Use Access Kit whenever possible
- Implanted ports should be accessed with the smallest and shortest non-coring needle available
 - Access needle should be flush to skin
 - Current 1" kits have CHG patch to be placed at insertion site
 - New kits (3/4" and 1") will have CHG Gel pad (no sooner than winter 2024)

- **Assessing and Care:**

- Assess like all VAD
- Dressing to be changed every 7 days and PRN
- If gauze at insertion site, dressing to be changed within 48 hours.

- **Flushing:**

- Accessed Implanted ports are to be flushed with at least 10mL 0.9% NS after each use
- If implanted port is accessed, but not used, it should be flushed at least once per day with 10mL 0.9% NS

- **Removal and re-access:**

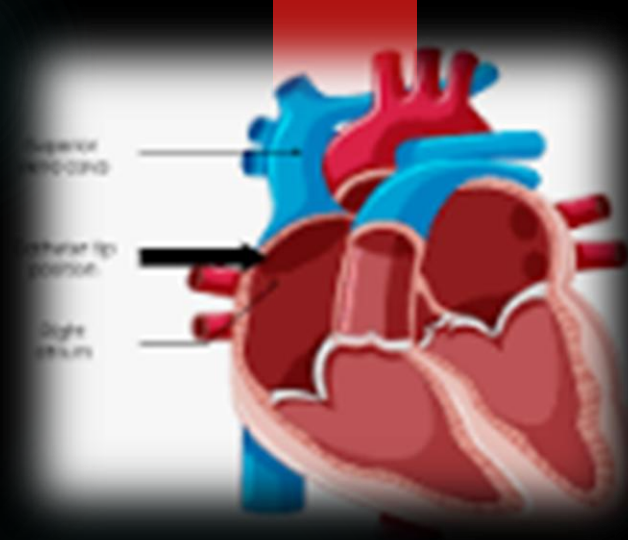
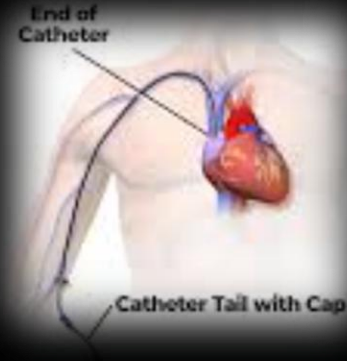
- If implanted port remains in use at 7 days, port will be de-accessed and re-accessed using access kit.

- **De-Accessing:**

- At time of de-accessing the implanted port will be flushed with 10mL 0.9% NS followed by 500units/5mL Heparin lock (as ordered).

Implanted Port Dressing Change

Tegaderm (TM) CHG Dressing Application and Removal for Implanted Ports



CENTRAL VENOUS ACCESS DEVICE

PICC, Short CVC & Implanted Port Blood Sampling

CVAD Blood Sampling Supplies

64

Gloves
Multiple alcohol pads
Sterile end cap
Appropriate vacuum tubes
10mL 0.9% sodium chloride flush syringes
MaxZero Needleless connector
(just in case contaminated, removed, or has blood in it after flush)

Vacuum Tube Method

Luer-lock vacuum tube holder
Appropriate vacuum tubes

Syringe Method

Syringes (3-5mL)

If lab not at bedside:

- Needleless transfer device
- Appropriate vacuum tubes

Always:

1. Perform hand hygiene before direct contact with patient
 2. Confirm patient ID (matches labels to be applied to specimens)
 3. Verify order
 4. Gather equipment
 5. Place patient is sitting or recumbent position
 6. Maintain sterility of the syringe tip
-
7. Repeat hand hygiene
 8. Apply gloves
 9. Stop infusion(s)
 10. Clamp all lumens
 11. Disconnect tubing set and cover with sterile luer cap
 10. Scrub hub with new alcohol prep x 5 sec, allow to dry
 11. Attach prefilled 10mL 0.9% NS syringe & flush
 12. Without removing syringe, aspirate 6mL of blood, then reinject blood into CVAD, repeating 5 cycles
 13. Disconnect empty syringe and discard
 14. Scrub hub with new alcohol prep x 5 sec, allow to dry

Blood Sampling CVAD Syringe Method PUSH PULL /MIXING Method

65

15. Attach empty syringe and aspirate
 - ▶ **Use 3-5mL syringe will allow better blood flow than a 10mL syringe**
 - ▶ **Repeat until enough blood is obtained.**
16. Scrub hub with new alcohol prep x 5 seconds, allow to dry
17. Attach a prefilled 10 mL NS syringe to MaxZero and perform pulsatile flush
18. Scrub hub with new alcohol prep x 5 sec, allow to dry
19. Attach prefilled 10mL 0.9% NS syringe, flush, & remove
20. Scrub hub with new alcohol prep x 5 sec, allow to dry
21. Remove luer cap from tubing set, attach, resume infusion(s)
22. Fill required blood collection tubes to the appropriate level, in the correct order using needleless transfer device.
23. Gently invert filled tubes per table p. 32

Always:

1. Perform hand hygiene before direct contact with patient
2. Confirm patient ID (matches labels to be applied to specimens)
3. Verify order
4. Gather equipment
5. Place patient is sitting or recumbent position
6. Maintain sterility of the syringe tip

7. Repeat hand hygiene
8. Apply gloves
9. Stop infusion(s)
 - ▶ Clamp all lumens
 - ▶ Disconnect tubing set and cover with sterile luer cap
10. Scrub hub with new alcohol prep x 5 sec, allow to dry
11. Scrub hub with new alcohol prep x 5 sec & allow to dry
12. Attach vacuum tube holder to MaxZero
13. Insert an additive-free vacuum tube into holder, aspirate 5 mL of blood and **DISCARD**

Blood Sampling CVAD Vacuum Tube DISCARD Method

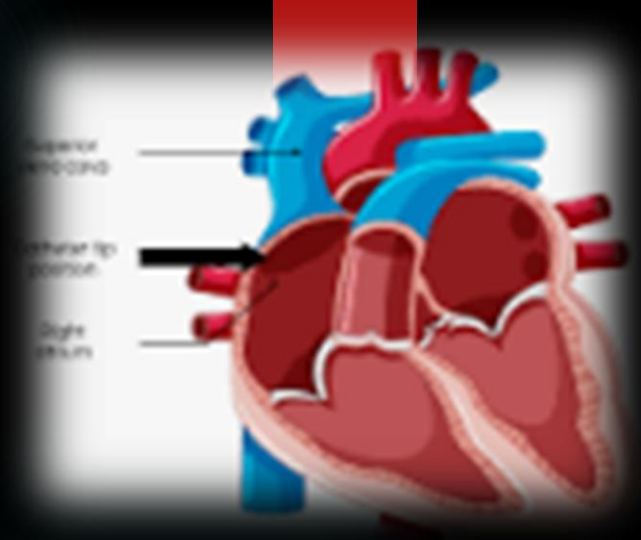
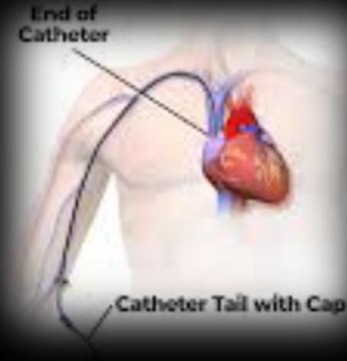
14. Insert the vacuum tubes into the holder in the correct sequence and allow each tube to fill to needed volume. Gently invert specimens according to table on p. 32.
15. Detach the holder, discard in sharps
16. Scrub hub with new alcohol prep x 5 sec, allow to dry
17. Attach prefilled 10mL 0.9% NS syringe, flush, & remove
18. Scrub hub with new alcohol prep x 5 sec, allow to dry
19. Remove luer cap from tubing set, attach, resume infusion(s)

Blood Sampling from CVAD

Points of Emphasis

67

- Use largest lumen or most distal lumen
- If drawing therapeutic drug levels
 - make sure use separate lumen of VAD
- **Do NOT** routinely use CVAD infusing TPN for blood sampling
- **Push-Pull Method** or mixing method for blood sampling reduces amount of blood wasted & reduces hub manipulation
- Use small syringes (3-5mL for better blood flow)
- If drawing blood cultures remove and replace MaxZero to reduce risk of false-positives



CENTRAL VENOUS ACCESS DEVICE PICC & Short CVAD Removal

PICC & Short CVC Removal

Removal requires careful technique to prevent complications such as:

- Bleeding
- Air embolism
- Catheter embolism

PICC & Short CVC Removal

1. Review physician order for Line removal.
2. Trace tubing and discontinue all infusions and clamp extension set.
3. Place a fluid-impermeable pad under patient's arm
4. Position patient supine or Trendelenburg, unless contraindicated.
5. Stabilize insertion site with one hand, beginning at hub, gently pull the dressing perpendicular to the skin toward the insertion site.
6. Repeat to remove stabilization device
7. Instruct the patient in Valsalva maneuver, or exhale if Valsalva is contraindicated.
8. Hold sterile gauze gently to insertion site with one hand, slowly withdraw catheter using gentle, even pressure.

***Stop if resistance is met:**

- Redress catheter site with sterile dressing
 - Apply warm compress above exit site
 - Have patient perform relaxation techniques
 - Elevate arm
 - Reattempt in 15-30 min
 - If resistance continues – contact provider
9. After successful removal apply light pressure to site with sterile gauze for 30 second or until hemostasis is achieved.
 10. While patient exhales immediately place folded petroleum-based gauze over insertion site.
 11. Cover petroleum gauze with sterile 4x4 and apply transparent semipermeable
 12. Date and time dressing for removal in 24 hours.
 13. Patient should remain supine for 30 minutes post line removal.
 14. Inspect the catheter:
Is it intact or jagged?

*If Jagged, your patient is at risk for breakage, apply tourniquet proximal to site and consult physician immediately.

Line: is the length appropriate as compared to document from insertion record?

VAD Documentation

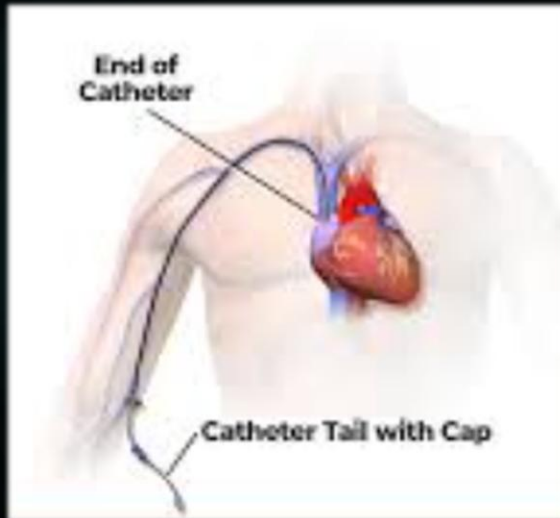
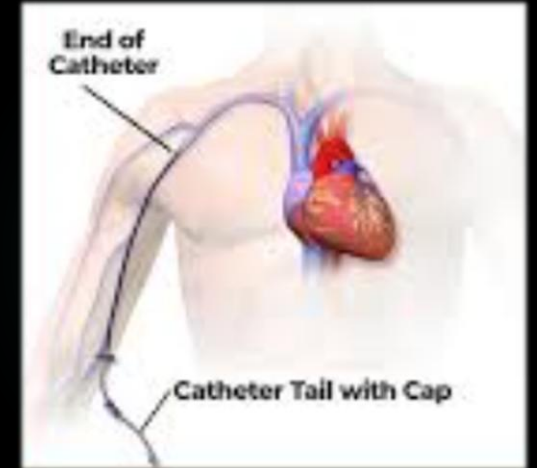
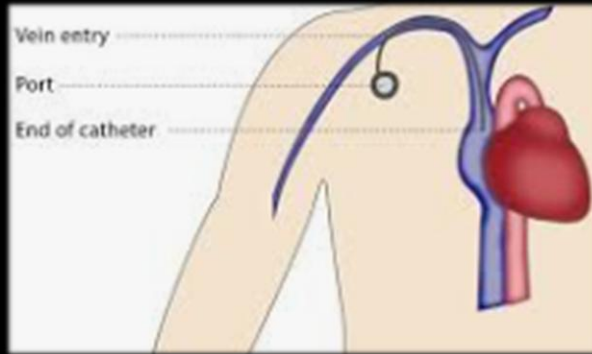
71

All care provided to and through a VAD should be documented.

In the following module (**VAD Updates to Orders, Documentation and Workflow**) you will learn how documentation has been optimized to assist you to accurately document what you have assessed and completed.

Documentation after removal

- Discontinued, record length of catheter removed, site condition, dressing activity, dressing, drainage present, patient response to activity, and direct pressure



VENOUS ACCESS DEVICE

Points of Emphasis

PVAD & CVAD Points of Emphasis

Insertion	Flushing	Tubing Sets
Competency required for RN, LPN, Paramedic short PIVC insertion	Pulsatile flush recommended	If multiple lines used label distal and proximal end with infusion type (i.e. TPN, Cardizem, Norepinephrine)
No more than 2 insertion attempts by one clinician then must escalate to clinician with higher skill level Ultrasound guidance may be required	Before every use aspirate to confirm blood return then flush with 10mL saline	Unless manufacturer's directions for use state otherwise, continuous sets are changed: • Every 96⁰ • When contaminated • With new IV start
Midlines and PICCs are inserted by RNs with documented competency by WCH approved company and require a screening tool at time of placing order	Use new syringe to flush between medications, after medications, and when converting to saline lock.	High risk medications will be given as primary infusion on separate infusion pump connected to lowest y-port of primary infusion
US guided short PIVC are inserted by RNs, LPNs, and Paramedic with documented competency	Always flush catheter at time of disconnection to saline lock.	When secondary intermittent meds are compatible , avoid disconnect; back prime between infusions
Clinicians will adhere to aseptic no-touch technique (ANTT) when performing all procedures (insertion, medication administration, flushing, blood sampling, dressing changes, and removal)		Intermittent sets are changed: • Every 24⁰ • When contaminated • With new IV start
		When secondary intermittent meds are incompatible , use separate secondary sets and place sterile luer cap between uses

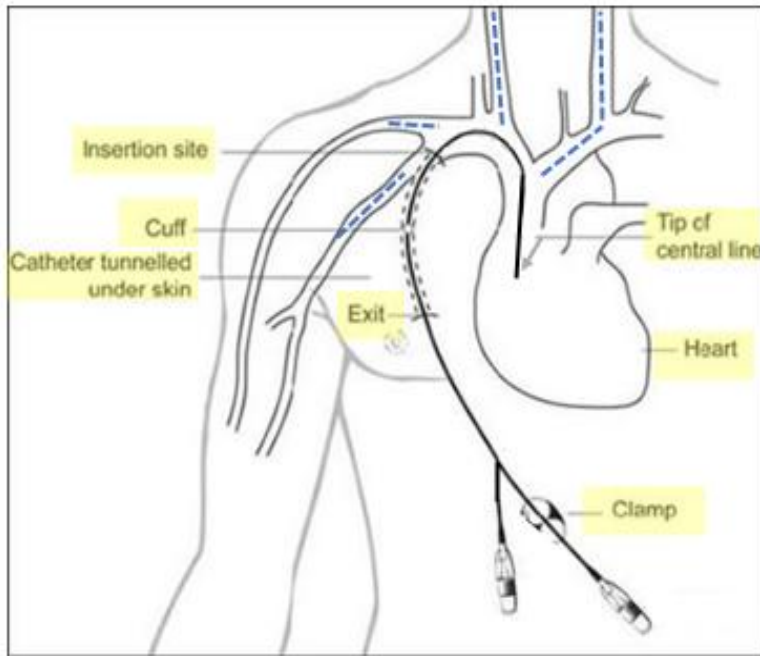


Vascular Access Guide

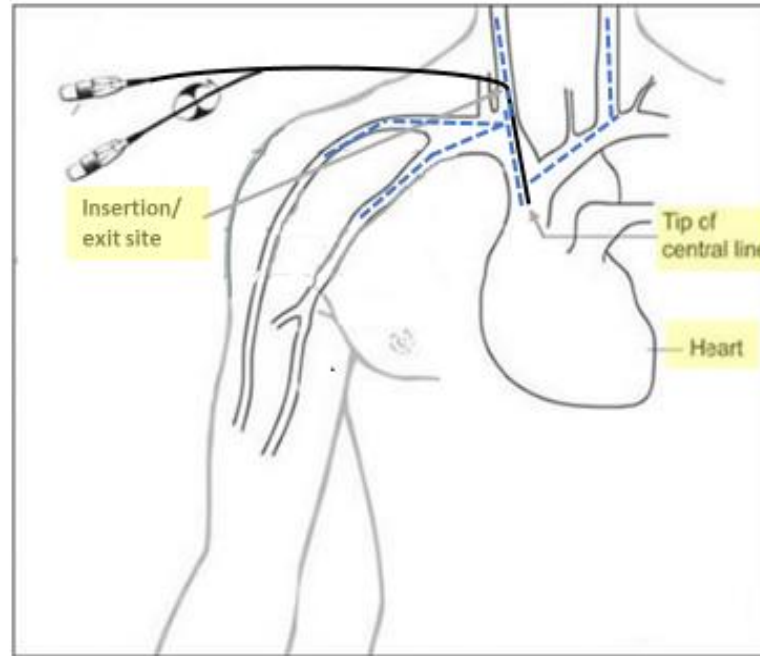
Flushing	Tubing Sets	Needleless Connector MaxZero
PULSATILE FLUSH recommended with VAD flush Directions: With Posiflush administer 10 short boluses of 1 mL interrupted by brief pauses	LABEL distal and proximal end with infusion type (i.e. TPN, Cardizem, Norepinephrine, NS)	SEQUENCE TO MAINTAIN POSITIVE BLOOD DISPLACEMENT MaxZero • FLUSH • DISCONNECT • CLAMP
Before every use ALL VADs will be aspirated to confirm blood return then flushed with pre-filled 10mL Posiflush. • If sluggish or no blood return, assess thoroughly to determine site condition.	CONTINUOUS SETS are changed every 7 days except: • When contaminated • With new IV start • Unless manufacturer's directions for use state otherwise	Change MaxZero every 7 days unless: • MaxZero is removed for any reason • Has blood or debris in it • Contaminated
A new Posiflush will be used to flush before, between, and after medications. Never use Posiflush as a medication diluent. Always flush VAD at time of disconnection with Posiflush	Compatible SECONDARY INTERMITTENT meds: • Back prime between infusions • Change per continuous set guidelines INTERMITTENT SETS are changed: • Every 24⁰ • When contaminated • With new IV start	Blood Sampling <u>Push-Pull Method</u> is used to reduce amount of blood waste in patient with • Hgb <8 g/dL, and • Frequent CVAD draws. Use only with CBC, eLytes, glucose, renal & liver function, CRP, blood gasses & Gent monitoring. Directions: Flush CVAD w/ pre-filled 10mL NS followed by a cycle of aspirating & reinfusing 6mL blood x 5 times before drawing sample
With 'final' de-access of an IMPLANTED PORT , flush with • Posiflush • Followed by Heparin 500units/5mL	Incompatible SECONDARY INTERMITTENT meds: • Use separate secondary sets and place sterile luer cap between uses • Label each secondary tubing with medication and date High risk medications will be given as primary infusion on separate infusion pump connected to lowest y-port of primary infusion	Discard Method is preferred blood sampling method.

Dialysis Catheters

Figure 1



**Tunneled Dialysis Catheter
(TDC)**



**Non-Tunneled Dialysis Catheter
(NTDC)**

- Dialysis catheters can be tunneled or non-tunneled
- Only dialysis RNs can access these catheters
- Students/Instructors are not to access, flush or care for these catheters

WCH Policies & Lippincott Procedures

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While this education module is lengthy, The intention was to remind you of current practices and the changes needed to meet the best standards of practice.

While this education module is lengthy, I can not include all aspects of care related to VADs.

Please refer to WCH Policies for more thorough description of VAD care and Lippincott Procedures. You will find applicable procedures linked within the WCH Policies.

References

Nickel, B., Gorski, L., Kleidon, T., et al (2024). Infusion Therapy Standards of Practice. 9th Ed. *J Infus Nurs.* 2024;47 Norwood, MA.

Infusion Nurses Society. *Policies and Procedures for Infusion Therapy: Acute Care*. 7th ed. Infusion Nurses Society; 2024.

End of Module

Please refer to the Policy:

Nursing Division Policy: Central Vascular Access Devices (CVAD); Management of PICC, Non-tunneled Central Venous Catheters, Tunneled Central Venous Access Catheters (CVC); Implanted Vascular Access Ports

VAD: Central Vascular Access Devices

Folder Location: /Wood County Hospital/Patient Services/Nursing Division

prescribed locking solution. Flush and Lock Implanted **Vascular Access** ports with at least 10mL of 0.9% sodium chloride daily when **accessed** but are without regular medication or a continuous infusion in progress. When de-**accessing** Implanted **Vascular Access** ports, flush with at least 10 mL of 0.9% sodium chloride followed by 3-5 ml of heparin (100units/mL) or prescribed locking solution

Please click the following link below to validate module completion

[Vascular Access Device Care and Maintenance Form](#)